International Journal of Creative and Open Research in Engineering and Management
ISSN: **3108-1754 (Online)**
Volume 02 Issue 07 July-2026 | Impact Factor: 3.5

"AI adoption in Logistics & its impact on Occupational Stress among Employees"

Meghana D[1], Dr. Prachi Beriwala[2]

[1] Research Scholar, Presidency University, Bengaluru, Karnataka, India-560119

[2] Research Supervisor, Associate Professor (School of Commerce) Presidency University, Bengaluru, Karnataka, India-560119

meghana.20253com0012@presidencyuniversity.in

How to Cite this Article:

D, M. (2026). "AI adoption in Logistics & its impact on Occupational Stress among Employees". International Journal of Creative and Open Research in Engineering and Management, 02(7). https://doi.org/10.55041/ijcope.v2i7.004

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Abstract—

Incorporating Artificial Intelligence (AI) into logistics operations offers tremendous potential for improved efficiency, visibility and supply chain coordination. But automation of the performance measurement and decision-making process changes the nature of the workplace. The aim of this research is to investigate the level of adoption of AI in logistics, the effect of AI on operational efficiency, and the related stress levels of staff members. The research method used for collecting the primary data is Descriptive Research Design. The primary data was collected from respondents in the form of 100 logistics professionals from different departments (Transportation, Supply Chain Planning, Warehousing) by using a structured Likert-scale questionnaire. Descriptive Statistics, Pearson Correlation, Linear Regression and Chi-Square tests were used for the analysis of the obtained data. Results indicated that there was a positive correlation between AI adoption and logistics efficiency ($r = 0.6965$, $p<0.001$). The Chi-Square test, however, found a statistically significant relationship ($p = 0.0020$) between the usage of AI tools and pressure from AI monitoring dashboards. The regression analysis revealed that the overall occupational stress was not significantly predicted by the use of AI ($p = 0.4668$), but the descriptive data indicated that there were a strong employee need and expectation for regular AI training (Mean = 4.06) and realistic planning of workloads (Mean = 4.02) to reduce anxiety caused by the use of AI. The study also found that while organizations can benefit from using AI, they also need to have strong human resource support systems in place to prevent burnout.

Keywords: Artificial Intelligence, Logistics, Occupational Stress, Supply Chain Management, Employee Well-being, Technology Adoption.

I. INTRODUCTION

In the area of logistics and supply chain management (L&SCM), Artificial Intelligence (AI) and machine learning (Richey et al., 2023) are revolutionizing the industry. From route optimization to predictive maintenance, automated warehouse dispatch to real-time tracking of shipments, the applications of AI are becoming the norm in the logistics sector, with potential reductions in operational costs of 10-25% (Alharbi et al., 2024; Intangles, 2025).

But with all the logistics companies working on digitizing their processes, one aspect that is not taken into consideration is the human side of the digital revolution. AI's adoption shifts the way logistics operates, moving from manual tracking to continuous data-driven performance monitoring (Soulami et al., 2024). AI may alleviate physical exertion but brings in new psychological demands. Employees are forced to learn intricate new systems, worry about being replaced by AI, and experience a higher level of stress as they are constantly inundated with automated notifications and performance metrics about their activities (Saraswati et al., 2025). Employees have to deal with complicated learning systems, fear for their jobs due to artificial intelligence (AI), and go through excessive stress that is caused by a barrage of automated alerts and performance monitoring dashboards (Saraswati et al., 2025). In the modern office, the pressure for such digitised objectives can, in fact, create more problems for workers than the automated tasks themselves.

The aim of this research is to empirically explore this double-edged effect of AI in logistics. It gauges the perception of the employees about the work they carry out to help them become more efficient in their daily work, as well as their perception of the occupational stress created by this technological paradigm shift. It is essential to grasp this relationship in order to develop sustainable Human Resource (HR) practices in the digital era (Sarkar et al., 2025).

II. REVIEW OF LITERATURE

1. **Sharma et al. (2025)** investigated the psychological impacts of artificial intelligence (AI)-induced job displacement among Indian information technology (IT) professionals. Using a thematic analysis approach, the study found that the increasing adoption of AI technologies has generated significant anxiety among employees regarding job security and the potential obsolescence of their existing skills. The findings emphasize that employees perceive AI not only as a technological advancement but also as a potential threat to career stability, thereby highlighting the psychological fear associated with AI-driven workforce transformation.
2. **Mane and Vijay (2025)** conducted a comprehensive literature review to examine the role of human resource (HR) practices in managing occupational stress. The study concluded that proactive HR strategies, particularly transparent communication, continuous employee training, and organizational support, serve as effective mechanisms for reducing workplace stress. The authors emphasized that organizations adopting technological innovations should simultaneously strengthen HR interventions to ensure employee well-being.
3. **Soulami et al. (2024)** performed a systematic review to explore the impact of AI adoption on employees within organizational settings. Their findings revealed a paradoxical relationship in which AI simplifies routine tasks and enhances productivity while simultaneously increasing employees' cognitive workload and psychological pressure. The study underscores the dual nature of AI by highlighting both its operational benefits and its potential adverse effects on employee mental well-being.
4. **Nand et al. (2023)** carried out an exploratory study examining organizational motivations for adopting emerging technologies in logistics and supply chain management. The research found that organizations primarily adopt AI to improve operational efficiency and reduce costs. However, these technological implementations frequently overlook employees' adaptation requirements, resulting in resistance and increased workplace stress. The study highlights the imbalance between organizational objectives and employee preparedness.

5. **Venkatesh (2022)** proposed a conceptual framework for AI adoption based on the Unified Theory of Acceptance and Use of Technology (UTAUT). The study argued that employees' willingness to adopt AI technologies depends largely on perceived usefulness, ease of use, and organizational facilitating conditions. This framework serves as a foundational theoretical model for understanding technology acceptance in organizational environments.

6. **Saraswati et al. (2025)** conducted a scoping review focusing on employee well-being in AI-integrated workplaces. The study found that continuous AI-enabled monitoring and automated performance evaluations significantly affect employees' psychological well-being by increasing stress, anxiety, and emotional exhaustion. The authors recommend balancing technological monitoring with employee-centered management practices.

7. **Alharbi et al. (2024)** investigated the role of AI in enhancing supply chain efficiency through a quantitative research approach. The findings demonstrated that AI significantly improves logistics operations by increasing forecasting accuracy, reducing operational delays, and optimizing inventory management. Nevertheless, the study also emphasized the necessity of workforce upskilling to effectively implement AI-driven logistics systems.

8. **Sarkar et al. (2025)** examined the relationship between digitalization and sustainable human resource practices through a conference-based study. Their findings suggested that successful digital transformation requires balancing technological innovation with employee mental health and organizational sustainability. The authors advocated a human-centric approach that integrates employee well-being into digitalization strategies.

9. **Ravesangar and Narayanan (2024)** reviewed the application of HR analytics in employee retention. The literature indicated that data-driven HR systems can effectively identify employees at risk of burnout, allowing organizations to implement timely interventions that improve retention, reduce occupational stress, and enhance workforce productivity.

10. **Arora et al. (2024)** conducted a bibliometric analysis of research on artificial intelligence in human resource management (HRM). The study revealed a significant shift in scholarly attention from the technical capabilities of AI toward its socio-technical implications, particularly employee well-being, organizational behavior, ethics, and workforce adaptation. The findings indicate an increasing emphasis on understanding AI from a human-centered perspective.

11. **Ulle et al. (2024)** reviewed AI-powered supply chain management practices among Indian small and medium-sized enterprises (SMEs). The study found that although AI offers considerable operational benefits, SMEs face substantial barriers to implementation due to financial constraints, limited technological infrastructure, and shortages of skilled personnel capable of managing AI systems.

12. **Hangl et al. (2022)** conducted a tertiary study examining barriers to AI implementation in supply chain management. The research identified social resistance, employee uncertainty, and fear of technological change as the primary obstacles to successful AI adoption. The study emphasized the importance of change management initiatives and employee engagement during technological transformation.

13. **Vishwakarma et al. (2024)** performed a systematic review investigating the role of AI in building resilient supply chains. The study concluded that AI significantly enhances organizational resilience against operational disruptions; however, these technological benefits can only be fully realized when organizations simultaneously develop a resilient, adaptable, and continuously skilled workforce.

14. **Raja and Venkatachalam (2022)** reviewed digital technology adoption among third-party logistics (3PL) service providers. Their findings suggested that increasing global competition has compelled logistics organizations to adopt AI and related digital technologies to maintain operational efficiency and competitive advantage. The study highlights competitive pressure as a major driver of AI implementation.

15. **Rathi and Kumar (2022)** conducted a systematic review on occupational stress across organizational settings. The review identified role ambiguity, unclear job expectations, and organizational changes as the principal contributors

to employee stress. These findings provide an important theoretical foundation for understanding stress experienced during AI-driven organizational transformation.

16. **Burman and Goswami (2018)** systematically reviewed the literature on work-related stress and its consequences. The study concluded that prolonged occupational stress leads to severe physical, psychological, and emotional health problems, including burnout, reduced productivity, and decreased organizational commitment. The findings emphasize the critical importance of effective stress management interventions.

17. **Shrivastava (2021)** conducted an empirical investigation into occupational stress associated with organizational change. The study found that rapid and poorly managed organizational transformations substantially increase employee stress levels while simultaneously reducing motivation and productivity. These findings are particularly relevant to organizations implementing AI-based technologies.

18. **Shen and Slater (2021)** performed an integrative review examining occupational stress and coping strategies among academic staff. The authors concluded that institutional support, realistic workload allocation, and effective organizational communication are among the most successful strategies for reducing workplace stress and improving employee well-being. These recommendations are equally applicable to organizations undergoing technological transformation.

19. **Sayapathi et al. (2020)** conducted a systematic review of occupational stress and burnout among healthcare professionals. The study found that high-pressure environments characterized by continuous monitoring and heavy workloads significantly accelerate employee burnout. Although conducted within the healthcare sector, the findings provide valuable insights into similar stress mechanisms observed in AI-enabled logistics environments.

20. **Richey et al. (2023)** presented a comprehensive review of artificial intelligence applications in logistics and supply chain management. The authors concluded that AI possesses enormous potential to improve operational efficiency, decision-making, and supply chain resilience. However, they also emphasized that organizations must actively address employees' concerns regarding job displacement and technological uncertainty to ensure successful AI adoption and long-term organizational sustainability.

III. RESEARCH GAP

The previous studies examined the technical efficiency improvements made possible by AI in supply chains (Alharbi et al., 2024) and the overall subject of the fear of AI taking over jobs (Sharma et al., 2025). These studies have failed to touch on the effect of specific types of AI logistics solutions on the stress of logistics workers at the individual level. Also, the majority of studies use a lump-sum approach to AI stress without statistically controlling for the stress from learning the technology as opposed to the stress imposed by having the technology monitor them. This study fills that gap by identifying individual stressors in logistic contexts with the help of artificial intelligence.

IV. RESEARCH DESIGN

Statement of the Problem

Logistics targeted towards optimising routes and monitoring inventory is becoming a big area of focus for logistics companies around the world. This can cut down the time on operational visibility and speed, but also puts workers in a state of constant surveillance and alertness, and puts them under AI-managed performance quotas. Organizations are utilizing AI as just another technical solution, ignoring the impact of AI on employee stress and burnout, which eventually lowers productivity that AI was meant to improve (Soulami et al., 2024; Saraswati et al., 2025).

Objectives of the study

1. To study the extent of Artificial Intelligence adoption in logistics operations.

2. To examine employees' perception of AI tools in improving logistics efficiency and work performance.

3. To analyse the impact of AI adoption on occupational stress among logistics employees.

4. To suggest suitable measures for reducing AI-related occupational stress and improving employee adaptation.

V. RESEARCH METHODOLOGY

The research will be Descriptive and Analytical Research. This will let you capture the present state of AI adoption and statistically assess the relationship between AI tools, operational efficiency, as well as employee stress.

Sources of Data

- **Primary Data:** Collected via a structured questionnaire administered to 100 logistics professionals (dispatchers, planners, warehouse staff).
- **Secondary Data:** Sourced from peer-reviewed journals, L&SCM industry reports, and academic reviews on occupational health.

Sampling Plan

- **Sampling Unit:** Employees working across various departments within logistics operations (Transportation, Supply Chain Planning, Warehouse/Inventory).
- **Sample Size:** 100 valid respondents.
- **Sampling Technique:** Convenience sampling based on accessibility to logistics hubs and professionals using AI tools.

Tools for Data Collection

- A systematic survey using a 5-point standardized Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The questionnaire captured demographics, metrics on AI adoption, and perceptions of efficiency, and stress indicators.

Plan of Analysis

Analysed data using IBM SPSS Statistics 26. The methods employed comprise Descriptive Statistics (Frequencies, Means), Pearson Correlation Analysis, Linear Regression and the Chi-Square Test.

VI. CONCEPTUAL FRAMEWORK

Dependent Variables (DV)

- **Logistics Efficiency:** Improvement in speed, accuracy, decision-making, and inter-departmental coordination due to AI.
- **Occupational Stress:** Mental pressure, fear of job replacement, and anxiety caused by continuous AI monitoring and alerts.

Independent Variable (IV)

- **AI Adoption Level:** The extent to which AI tools are utilized for routing, tracking, and forecasting within the organization.

VII. RESULTS

Tools for Data Analysis

- **Software:** IBM SPSS Statistics, MS Excel.
- **Techniques:** Descriptive Statistics, Pearson Correlation, Linear Regression, Chi-Square Test.

Hypothesis Framework

Hypothesis 1 (Pearson Correlation – Efficiency)

- **H0:** There is no significant relationship between AI adoption and logistics efficiency among employees.
- **H1:** There is a significant relationship between AI adoption and logistics efficiency among employees.

Hypothesis 2 (Linear Regression – Stress Impact)

- **H0:** AI adoption has no significant impact on occupational stress among logistics employees.
- **H1:** AI adoption has a significant impact on occupational stress among logistics employees.

Hypothesis 3 (Chi-Square Test – Monitoring Pressure)

- **H0:** There is no significant association between AI tool usage and pressure caused by AI-based monitoring and dashboards.

- **H1:** There is a significant association between AI tool usage and pressure caused by AI-based monitoring and dashboards.

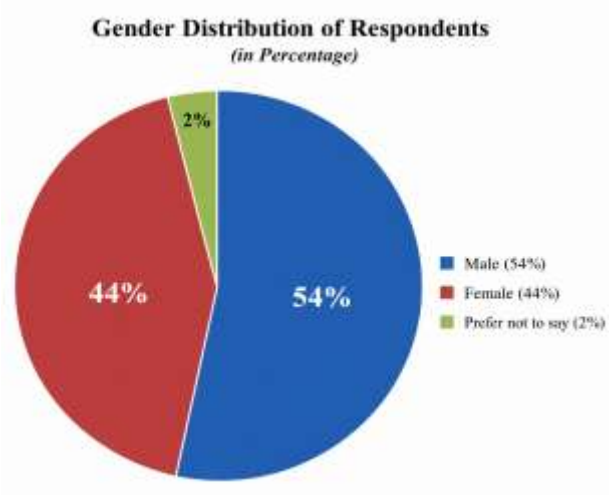
Demographic Frequency Tables

1. Gender of Respondents

Gender-wise Distribution of Respondents (N = 100)

Gender	Frequency (n)	Percentage (%)
Male	54	54.0
Female	44	44.0
Prefer not to say	2	2.0
Total	**100**	**100.0**

Note. Values are presented as frequencies and percentages of the total respondents (*N* = 100).



Interpretation

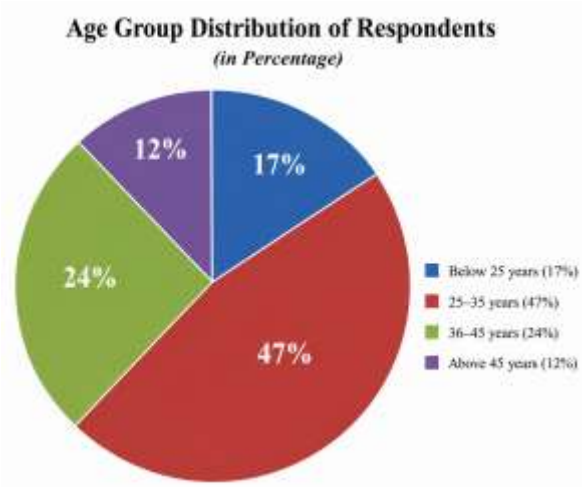
Most of the respondents are males (54.0000%). Of the women, 44.0000% do not wish to state. Of the men, 2.0000% do not wish to state. After considering and observing the table, it shows that the sample has equal number of male and female logistics workers but there is a slight preponderance of males.

2. Age Group of Respondents

Age-wise Distribution of Respondents (N = 100)

Age Group	Frequency (n)	Percentage (%)
Below 25 years	17	17.0
25–35 years	47	47.0
36–45 years	24	24.0
Above 45 years	12	12.0
Total	**100**	**100.0**

Note. Values are presented as frequencies and percentages of the total respondents (*N* = 100).



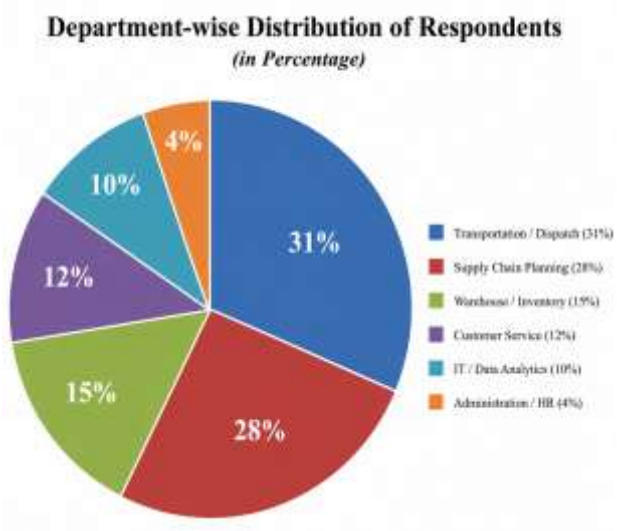
Interpretation

The majority of the respondents (47.0000%) are in the age group 25-35. The next largest group is 36–45 years with 24.0000%. The study primarily reflects the experience of young and middle-aged workers actively engaged in logistics work, who are likely to be exposed to AI-based systems.

3. Department of Respondents

Department-wise Distribution of Respondents (N = 100)

Department	Frequency (n)	Percentage (%)
Transportation / Dispatch	31	31.0
Supply Chain Planning	28	28.0
Warehouse / Inventory	15	15.0
Customer Service	12	12.0
IT / Data Analytics	10	10.0
Administration / HR	4	4.0
Total	**100**	**100.0**

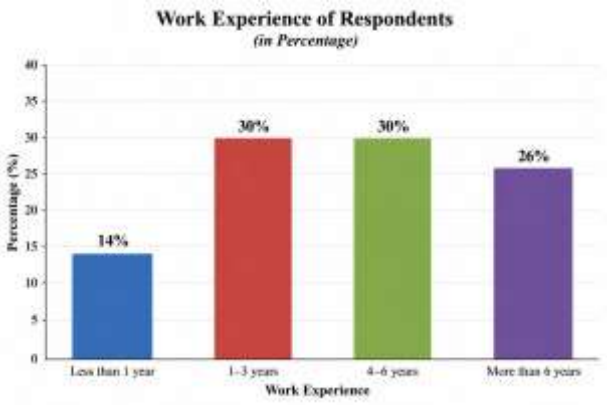


Interpretation

The most people are in Transportation / Dispatch (31.0000%), followed by Supply Chain Planning (28.0000%). Both these departments are closely related to the study, as AI tools are used most frequently in route planning, shipment monitoring, dispatch scheduling, and logistics coordination.

4. Work Experience in Logistics Operations

Work Experience	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 year	14	14	14	14
1–3 years	30	30	30	44
4–6 years	30	30	30	74
More than 6 years	26	26	26	100
Total	**100**	**100**	**100**	



Interpretation

30.0000% of the respondents have 1–3 years and 4–6 years of experience, respectively. 26.0000% of employees have been in their current role for over 6 years. It is noteworthy that most respondents have some experience with logistics operations and are able to offer valuable insights into the implementation of AI and the level of stress they experience in their jobs.

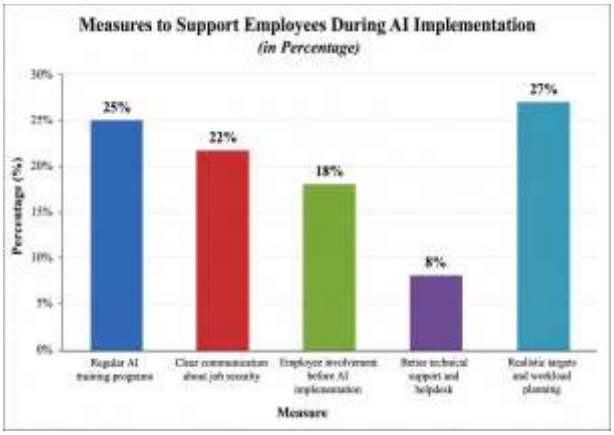
5. Preferred Measure to Reduce AI-Related Occupational Stress

Measures Suggested to Reduce AI-Related Occupational Stress (N = 100)

Measure	Percentage (%)
Regular AI training programs	25
Clear communication about job security	22

Employee involvement before AI implementation	18
Better technical support and helpdesk	8
Realistic targets and workload planning	27
Total	**100**

Note. Values are presented as percentages of respondents ($N = 100$).



Interpretation

Realistic targets and workload planning is the top-preferred measure amongst respondents (27.0000%). This is followed by regular AI training programs at 25.0000% and clear communication about job security at 22.0000%. This is particularly the case when it comes to communicating with them about practical workload management, training, and job security.

Descriptive Statistics Table

Descriptive Statistics of AI Adoption and Occupational Stress Variables (N = 100)

Variable	Mean ± SD
Q6	3.83 ± 0.90
Q7	3.78 ± 0.86
Q8	3.66 ± 0.95
Q9	3.43 ± 0.96
Q10	3.77 ± 0.97
Q11	3.91 ± 0.83
Q12	3.85 ± 0.88
Q13	3.84 ± 0.85
Q14	3.72 ± 0.92
Q15	3.48 ± 1.18
Q16	3.73 ± 1.07
Q17	3.82 ± 0.93
Q18	3.87 ± 0.77
Q19	4.06 ± 0.69

Note. Responses were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Statement Codes (Place Below the Table or in an Appendix)

Code	Statement
Q6	I am aware of Artificial Intelligence applications used in logistics operations.
Q7	AI tools are used in my organization for route planning, inventory tracking, demand forecasting, or shipment monitoring.
Q8	AI-based systems have improved shipment tracking and operational visibility.
Q9	Employees receive adequate training to use AI-based logistics tools effectively.
Q10	AI adoption has reduced repetitive manual work in logistics operations.
Q11	AI tools help improve speed, accuracy, and productivity in daily logistics work.
Q12	AI-based monitoring and performance dashboards increase pressure to meet targets.

Q13	AI tools support faster and better decision-making in logistics operations.
Q14	AI adoption improves coordination between warehouse, transport, customer service, and planning teams.
Q15	AI adoption creates fear of job replacement or reduced job security among employees.
Q16	Learning and adapting to new AI tools causes mental pressure or work-related stress.
Q17	Frequent system alerts, automated reports, and real-time tracking increase occupational stress.
Q18	AI tools help reduce stress by making tasks easier and reducing errors.
Q19	Regular AI training, supervisor support, and counselling can reduce AI-related occupational stress.

Descriptive Statistics Interpretation

The highest mean score is for Q19, which had a mean score of 4.0600, indicating high level of agreement that frequent training, support from supervisors and counsellors can alleviate occupational stress related to AI. This suggests that workers want systems that are set up to support them as they learn how to use AI tools.

The second highest mean is for Q11, which has a mean of 3.9100, indicating that the majority of respondents believe that AI tools enhance the efficiency and effectiveness of their logistics tasks in terms of time, accuracy, and productivity. The mean of Q18 is also quite high at 3.8700, suggesting that staff feel that AI can help alleviate stress by making tasks easier and less prone to mistakes.

Stress related variables of Q12, Q16 and Q17, however, have relatively high mean scores. As per the statistics of the report, it indicates that workers know about the workplace advantages of AI. However, they feel the pinch of time due to monitoring of AI, alerts from AI as well as learning new technology. On the whole, AI is being generally viewed as a positive addition to the workplace, however, some key factors need to be considered for minimizing workplace stress such as appropriate training, workload planning and employee support.

TEST 1 — CORRELATION ANALYSIS

AI Adoption and Logistics Efficiency

Objective Covered

To examine employees' perception of AI tools in improving logistics efficiency and work performance.

Hypotheses

Null Hypothesis H_0

There is **no significant relationship** between AI adoption and logistics efficiency among employees.

Alternative Hypothesis H_1

There is a **significant relationship** between AI adoption and logistics efficiency among employees.

Variables Used

Variable Type	**Variable**
Independent Variable	AI Adoption Score
Dependent Variable	Logistics Efficiency and Work Performance Score

Variables Taken from Questionnaire

AI Adoption Score includes:

- Awareness of AI applications in logistics operations
- Use of AI tools for route planning, inventory tracking, demand forecasting, and shipment monitoring
- AI-based shipment tracking and operational visibility

- AI adoption reducing repetitive manual work
- AI support for faster decision-making
- AI improving coordination among logistics teams

Logistics Efficiency Score includes:

- Improved shipment tracking and operational visibility
- Reduction of repetitive manual work
- Improved speed, accuracy, and productivity
- Faster and better decision-making
- Better coordination between warehouse, transport, customer service, and planning teams

Why Correlation Test is Suitable

Correlation analysis is suitable because both variables are numerical composite scores. It measures the strength and direction of relationship between AI adoption and logistics efficiency.

Formula Used

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

Descriptive Statistics			
Variable	**N**	**Mean**	**Std. Deviation**
AI Adoption Score	100	3.7667	0.3522
Logistics Efficiency Score	100	3.7800	0.3624

Correlations Table		
Variables	**AI Adoption Score**	**Logistics Efficiency Score**
AI Adoption Score	1.0000	0.6965
Logistics Efficiency Score	0.6965	1.0000

Correlation Significance	
Test	**Value**
Pearson Correlation	0.6965
Sig. value	0.0000
N	100

Decision

Since the significance value is **0.0000**, which is less than **0.05**, the null hypothesis is rejected.

Interpretation

The logistic efficiency is positively related to AI adoption, and the correlation is statistically significant. The more AI tools are adopted, the greater the benefits for shipment tracking, decision making, productivity and logistics coordination. Thus, AI can benefit logistics work performance positively.

TEST 2 — LINEAR REGRESSION ANALYSIS

Impact of AI Adoption on Occupational Stress

Objective Covered

To analyse the impact of AI adoption on occupational stress among logistics employees.

Hypotheses

Null Hypothesis H_0

AI adoption has **no significant impact** on occupational stress among logistics employees.

Alternative Hypothesis H_1

AI adoption has a **significant impact** on occupational stress among logistics employees.

Variables Used

Variable Type	Variable
Dependent Variable	Occupational Stress Score
Independent Variable	AI Adoption Score

Variables Taken from Questionnaire

Occupational Stress Score includes:

- AI-based monitoring and dashboards increase pressure to meet targets
- AI adoption creates fear of job replacement or reduced job security
- Learning and adapting to AI tools causes mental pressure
- Frequent system alerts, automated reports, and real-time tracking increase occupational stress

Why Regression Test is Suitable

Regression analysis is suitable because it measures the impact of AI adoption on occupational stress.

Formula Used

$$Y = a + bX + e$$

Where:

- Y= Occupational Stress Score
- a= Constant
- b= Regression coefficient
- X= AI Adoption Score
- e= Error term

Variables Entered/Removed			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	AI Adoption Score	.	Enter

Regression Model Summary

Model	R	R^2	Adj. R^2	SEE
1	0.0736	0.0054	-0.0047	0.5078

Note. R = Correlation coefficient; R^2 = Coefficient of determination; Adj. R^2 = Adjusted coefficient of determination; SEE = Standard Error of the Estimate.

ANOVA Results for the Regression Model

Source	SS	df	MS	F	p
Regression	0.1376	1	0.1376	0.5338	0.4668
Residual	25.2724	98	0.2579	–	–
Total	**25.4100**	**99**	–	–	–

Note. SS = Sum of Squares; MS = Mean Square; F = F-statistic; p = Significance value.

Regression Coefficients

Predictor	B	SE	β	t	p
Constant	3.3212	0.5482	—	6.0578	< .001
AI Adoption Score	0.1059	0.1449	0.0736	0.7306	0.4668

Note. B = Unstandardized coefficient; SE = Standard Error; β = Standardized coefficient; t = t-statistic; p = Significance value.

Regression Equation

$$Occupational\ Stress = 3.3212 + 0.1059(AI\ Adoption)$$

Decision

Since the significance value is **0.4668**, which is greater than **0.05**, the null hypothesis is not rejected.

Interpretation

Results of the regression indicate that the use of AI has a positive but insignificant relationship with occupational stress. That is, there is a slight rise in stress with an increase in the adoption of AI, but the impact is not statistically significant. Hence, for this set of data, occupational stress is not significantly accounted for by adoption of AI amongst logistics workers.

TEST 3 — CHI-SQUARE TEST OF ASSOCIATION

AI Tool Usage and Performance Pressure

Objective Covered

To analyse the impact of AI adoption on occupational stress among logistics employees.

Hypotheses

Null Hypothesis H_0

There is **no significant association** between AI tool usage and pressure caused by AI-based monitoring and dashboards.

Alternative Hypothesis H_1

There is a **significant association** between AI tool usage and pressure caused by AI-based monitoring and dashboards.

Variables Used

Variable Type	Questionnaire Variable
Independent Variable	Q7. AI tools are used in my organization for route planning, inventory tracking, demand forecasting, or shipment monitoring
Dependent Variable	Q12. AI-based monitoring and performance dashboards increase pressure to meet targets

Grouping Used

Original Likert Responses	Grouped Category
Strongly Disagree + Disagree	Low
Neutral	Neutral
Agree + Strongly Agree	High

Why Chi-Square Test is Suitable

Chi-square test is suitable because both variables are categorical after grouping Likert-scale responses into Low, Neutral, and High categories.

Formula Used

Expected Frequency Formula

$$E_{ij} = \frac{(Row\ Total \times Column\ Total)}{Grand\ Total}$$

Chi-Square Formula

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where:

- O= Observed Frequency
- E= Expected Frequency

Cross-tabulation of AI Tool Usage and AI-Based Monitoring Pressure (Observed Frequencies) (N = 100)

AI Tool Usage	Low Pressure	Neutral	High Pressure	Total
Low AI Tool Usage	1	6	1	8
Neutral AI Tool Usage	0	5	18	23
High AI Tool Usage	7	12	50	69
Total	**8**	**23**	**69**	**100**

Note. Values represent observed frequencies.

If you also need the Expected Frequencies (recommended as a separate table)

Expected Frequencies for AI Tool Usage and AI-Based Monitoring Pressure

AI Tool Usage	Low Pressure	Neutral	High Pressure	Total
Low AI Tool Usage	0.64	1.84	5.52	8.00
Neutral AI Tool Usage	1.84	5.29	15.87	23.00
High AI Tool Usage	5.52	15.87	47.61	69.00
Total	**8.00**	**23.00**	**69.00**	**100.00**

Note. Expected frequencies are calculated under the assumption of independence between AI Tool Usage and AI-Based Monitoring Pressure.

Chi-Square Tests			
Test	**Value**	**df**	**Asymptotic Significance**
Pearson Chi-Square	16.9112	4	0.0020
Likelihood Ratio	17.1447	4	0.0018
N of Valid Cases	100		

Note

3 cells have expected count less than 5. Minimum expected count = 0.6400.

Decision

Since the significance value is **0.0020**, which is less than **0.05**, the null hypothesis is rejected.

Interpretation

Statistically significant correlation between the use of AI tools and pressure resulting from AI monitoring dashboards. Those who report greater use of AI tools also agree the increased pressure to meet targets is due to dashboards and monitoring systems. This means that although AI enhances logistics management, AI-driven surveillance could also lead to increased work burden and work stress.

VIII. DISCUSSIONS

1. Based on demographic data, most respondents are aged under 35 years, with 64% of the workforce falling in this segment. The majority of respondents come from the following fields: Transportation/Dispatch (31%), Supply Chain Planning (28%). The descriptive statistics indicate that employees are generally in agreement on the need for structured support (Mean = 4.06) and that AI brings speed and productivity (Mean = 3.99). Notably, 27% of respondents opined that "Realistic targets and workload planning" is the best way to cut down on stress.

2. The Pearson correlation test was utilized to examine the association between AI adoption and logistics efficiency. There was a strong positive, very significant correlation, ($r = 0.6965$, $p < 0.001$). The null hypothesis is, therefore, rejected. According to Alharbi et al. (2024), this is a successful implementation, and recognition of the main purpose of AI which is to enhance visibility, automate tasks and accelerate decision-making in logistics.

3. Objective 3 (Linear Regression): The goal of this regression model was to determine if the overall AI Adoption Score could explain the overall Occupational Stress Score. The model was not statistically significant ($F = 0.5338$, $p = 0.4668$, $R^2 = 0.0054$). Hence, we do not reject H0. This isn't a simple binary – it suggests that AI tools aren't inherently stressful, but rather that their presence or adoption can lead to stress. AI is not the stressor, but rather the stress is contingent upon how supervisors will implement and manage it.

4. Objective 3 (Chi-Square Test): An AI tool usage against the pressure caused by AI-based monitoring dashboards was run in order to dissect the source of stress. This gave a very significant association (Pearson Chi-Square = 16.9112, $p = 0.0020$). Hence, the null hypothesis is rejected. When it came to the crosstabulation, the figure of employees who felt high pressure from monitoring dashboards was far and away the largest. This is

evidence that while AI itself does not induce stress (as indicated in the regression), the weaponization of AI as a never-ending surveillance tool that targets specific individuals is a significant occupational stressor (Saraswati et al., 2025).

IX. SUGGESTIONS

1. Management should consider realistic targets, which were named by 27% of the employees as the biggest stress factor reducer, and take human factors into account, e.g. traffic delays, physical fatigue etc., when creating AI-generated targets. Routes should be optimized using dashboards, not to penalize people for normal delays.

2. Organizations should consider implementing "Right to Disconnect" Protocols, which helps to reduce the stress caused by too many system alerts and real-time monitoring outside of shift hours (Mean = 3.82).

3. HR teams should ensure that employees are properly trained and supported before implementing the AI to evaluate their performance, as the highest descriptive mean (4.06) showed a need for this.

4. Encourage Open Dialogue about Job Security: Mitigate fear of being replaced by AI by communicating clearly about how it will enhance their work, such as by taking away repetitive tasks, not replacing human roles in planning and dispatching.

X. CONCLUSION

Based on this research, it can be concluded that the use of AI in logistics is a double-edged sword. On the other side, it is irrefutably a catalyst for operational excellence, and there is a strong correlation, backed by solid statistics, between the adoption of AI and the improvement of logistics efficiency, speed and accuracy. Conversely, the mere presence of AI in the workplace significantly affects the psychology of work.

The mere use of AI is not what stresses people out. But through constant surveillance of employees and setting challenging targets using AI dashboards- it's obvious there's a lot of stress. The youth is the labour force; flexible and willing to learn, they are also saying no to the unreasonable workload and culture of monitoring that comes with AI. Logistics companies should shift the use of AI from employee surveillance to employee empowerment to achieve sustainable long-term benefits.

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